



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Norman Goris, et al.

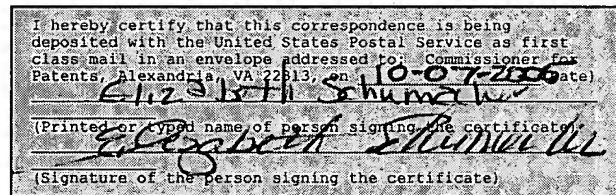
Serial No.: 10/669,848

Filed: September 24, 2003

Title: SYSTEM AND METHOD FOR USING A MOBILE TELEPHONE TO
RETRIEVE INFORMATION ABOUT AN ARTICLE

Grp./A.U.: 2686

Examiner: Jaime Michele Holliday

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

AFFIDAVIT UNDER 37 C.F.R. §1.131

I, Wolfgang Scheit, hereby state:

1. I am an inventor of the claimed subject matter in the Patent Application identified above and an inventor of the subject matter described therein.
2. Prior to February 26, 2003, I participated in the conception of a barcode reader added to a mobile telephone, as covered by the above-identified Patent Application, as evidenced by the submission of a form disclosing the invention to the company that I work for, which form is a standard form kept in the regular course of business. A true and correct copy of the form disclosing

such invention is attached hereto as Exhibit A.

3. Thereafter, I diligently participated in the preparation of the necessary information for the subsequent filing of the above referenced Patent Application. An initial draft of a patent in the form of an English translation of a foreign application was prepared in Germany by Blumbach, Kramer & Partner Gbr, a copy of which is attached as Exhibit B. On June 30, 2003, I signed an approval of the text and drawings of this draft, a copy of which approval is attached as Exhibit C. United States patent counsel then prepared the above referenced Patent Application for filing in the United States, which application I reviewed. The above referenced Patent Application was filed with the United States Patent and Trademark Office on September 24, 2003.

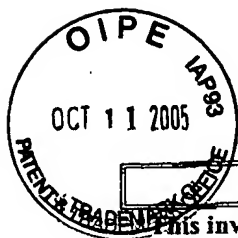
4. I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the Application or any patent issuing thereon.

Wolfgang Scheit
Wolfgang Scheit

Subscribed to before me on this the 7 day of October, 2005.

Haili Wang
Witness

EXHIBIT A



III

IC Design

AGERE SYSTEMS INVENTION SUBMISSION

This invention submission is being provided to an attorney in order to determine how to protect intellectual property and to facilitate efforts to acquire appropriate protection. Distribution of this invention submission shall be limited to attorneys and persons acting on behalf of Agere to facilitate making such determinations.

Name(s) of Submitters	Telephone No:	Loc/Room	SBU/Org. Title:	HR ID:	E-Mail Address
Wolfgang Scheit	+49-89-45918-442		Optimay	5970265	wscheit@agere.com
Norman Goris	+49-89-45918-423		Optimay	7976266	ngoris@agere.com

TITLE: Use of the mobile phone as barcode reader

Important Notes: (1) Keep in mind that your submission should be written so it can be understood in 5 to 10 minutes by a generalist. Avoid the use of undefined acronyms and jargon. Keep the language simple. (2) Have any of the above submitter(s) discussed this invention with, or provided an invention submission disclosing this invention to, an attorney other than the recipient of this invention submission? YES X NO

IP LAW USE	
Submission No:	1341639
Date Received:	2/28/03
Attorney:	John Veschi

1. Describe the problem your invention solves:
Barcode reader in the mobile phone.

2. Based on information of which you are already aware, describe:
(i) previous attempts to solve the problem your invention solves:
none

(ii) the disadvantages of the previous attempts:

3. Summarize (30 words or less) the new feature(s) of your invention that solve the problem:
Get access to the barcode translation of a product into the correct currency.

4. Succinctly describe your invention, referring to drawings, sketches, photographs, etc., in sufficient detail to enable one knowledgeable in the invention's field of technology to understand construction and operation of the invention. Drawings, etc., should show only those features necessary for an understanding of the invention. Describe how/why your invention overcomes the disadvantages noted in 2. (ii) above.

A barcode reader is added to the mobile phone to read the barcode of a product one would like to buy. When one enters a shop the mobile phone is synchronized with the barcodes of the shop, then one can take the products in the shop and has immediately access to the price of the product over the barcode.

5. Advantages of your invention:

- The user gets no surprise when he has to pay because he already know the correct price of the product.

*** Provide the information requested in this box on each page of the submission, as well as drawings, sketches, photographs, etc. ***

Submitter(s) signature(s) and date:

This invention submission has been read and understood by the following two witnesses:

Norman Goris
Wolfgang Scheit

26/02/2003

date

16.12/03

date

date

date

ATTORNEY-CLIENT PRIVILEGED DOCUMENT

• Explain how use of your invention would be detected:
Detection is obvious and easy.

*** Provide the information requested in this box on each page of the submission, as well as drawings, sketches, photographs, etc. ***
Submitter(s) signature(s) and date:

Norbert G. J.
Volfgang Schrot

26/02/03
date
26/2/03
date

This invention submission has been read and
understood by the following two witnesses:

date

date

ATTORNEY-CLIENT PRIVILEGED DOCUMENT

EXHIBIT B

030P 0107DEP

Agere Inc. Anm.



Use of the mobile phone as barcode reader

Description

5 Field of the Invention

The invention relates to the provision of readable information related to an article having a coded information in general and especially to a method of providing a user of a mobile communication device having a camera with such information as well as to a device having a functionality adapted to be used for the method.

Background of the Invention

15 Almost every article that can be bought in a shop or a warehouse is nowadays provided with coded information attached to it. The most commonly used code in this respect is the barcode, usually in the form of a 1-dimensional barcode, though 2-dimensional barcodes are also utilized increasingly.

20 The cash desk of a shop usually is provided with a barcode reader connected to a computer having access to a database holding information on the assortment of the shop and especially holding information on the prizes associated with each article sold in the shop. The same database often also holds inventory information on how many pieces of each article are currently in stock.

25 Especially in shops with a very large assortment a customer often gets in a situation in which he wants to know the prize of an article that has no readable prize on or next to it and therefore needs to read the coded information, especially the prizing information. For this purpose some shops provide "public" barcode or similar readers. This however involves additional costs and an additional service is needed.

Another situation in which it would be very useful for the customer to be able to read the coded information is in a shop that accepts all kinds of different currencies, for instance located at an international airport, in order to get the pricing information for an article in his own currency.

Furthermore it is necessary for shop employees to be able to read the coded information and relate this information to the prize of an article.

A possibility for reading barcode based information is to use a barcode reader equipment which can be connected to a mobile phone enabling the user to send the information to a certain server based service with a database for receiving back the pricing information at the mobile phone. However, one problem thereof is that in addition to a mobile phone a separate additional equipment is needed which reduces the ease of use and increases the costs. Additionally the performance is restricted due to the limited bit-rates GSM communication networks still offer.

An object of the invention is therefore to provide with respect to the above discussed state of the art a new and improved way to get readable information based on coded information attached to an article, in particular in an easy, low cost and fast manner.

Summary of the Invention

The inventive solution of the object is surprisingly achieved by each of the subject matter of the respective attached independent claims.

Advantages and/or preferred embodiments or refinements are the subject matter of the respective attached dependent claims.

Accordingly the invention proposes a method of providing a user of a mobile communication device having a camera with information related to an article having a coded information attached thereto, comprising the steps of synchronizing a database within the memory of the mobile communication device with at least one database located on at least one

server, recording an image of the coded information of the article by means of the camera, analyzing the record for ascertaining the information embedded within the record, and comparing the ascertained information with information stored within the synchronized database of the mobile communication device.

The step of synchronizing the database within the mobile communication device can be performed using an infrared connection. The advantage thereof is that most commercial mobile communication devices nowadays already provide an infrared interface and a corresponding interface on the server side is inexpensive.

In another preferred embodiment of the method the step of synchronizing is performed using a direct radio link, in particular according to Bluetooth, WLAN (Wireless Local Area Network) or HomeRF/SWAP (Home Radio Frequency/ Shared Wireless Access Protocol) standards. Bluetooth is a method for data communication that uses short-range radiolinks just as WLAN and HomeRF, Bluetooth having the slightly shorter range and lower bit-rate, but having the advantage of ad-hoc-connectivity and also of requiring less power.

The range of Bluetooth for instance is approximately ten meters, so typically there is at least one "hot spot" installed in a shop which a number of persons can use simultaneously for synchronizing the databases of their mobile communication devices.

To incorporate additional functionality to the mobile communication device the method comprises with advantage the transmitting of a software application from the server to said device and the storing of the application in the memory of said device prior to the step of synchronizing the databases.

To flexibly adapt to different database structures the said transmitted application can also provide the structure of the database to be synchronized.

According to specific embodiments of a respective mobile communication device and/or of the used camera, the step of recording is performed according to a first preferred embodiment by taking a picture with a photo camera or according to a second preferred embodiment by taking a video sequence in case the camera is provided as being a video

camera.

Preferred embodiments of the inventive method propose the analyzing a picture or a video sequence with regard to information embedded within being performed by means of a corresponding decoding system and/or picture recognition system implemented in the mobile communication device. Thus even if in principle, each known or future analyzing technology can be used with the invention, according to a very preferred embodiment and with regard to the most used way of coding information by means of a barcode, the mobile communication system comprises a barcode reader functionality by which the analyzing is performed. Preferably, the analyzing functionality is implemented within the mobile communication device by use of hardware and/or software elements.

The invention further proposes to provide the user visually and/or acoustically with the decoded and/or ascertained information related to the article to which the coded information is attached.

Since in most cases the information of interest is the prize of the article, the method comprises with advantage the information in the database to contain information on at least one prize of at least one article.

In order to provide prizing information in more than one currency, the information in the database preferably contains information on at least two prizes of at least one article in different currencies.

To preserve access to the decoded information for a later time the invention further proposes to store the ascertained information of at least one record within a memory of the mobile communication device.

Especially for checking the inventory of a shop it is also useful to store the ascertained information of a plurality of records within a memory of the mobile communication device. That way inventory data can be collected in an easy and fast manner by one or more employees of a shop. For the further processing of these collected data they have to be transmitted to a server.

This can of course be done by means of the already above described infrared connection or direct radio link. But that would mean to always

have to come back to the above mentioned "hot spot" to perform the data transfer. This can be time-consuming if a complete inventory check is done.

Therefore the invention further proposes to perform the step of
5 transmitting the ascertained information to the server via a GSM and/or UMTS communication network which can be used by the mobile communication device, the network in particular supporting GPRS (General Packet Radio Service), HSCSD (High Speed Circuit Switched Data) and/or EDGE (Enhanced Data Rates for GSM Evolution) standards. In this respect the inventive
10 method also includes said transmission to be performed by means of a MMS, SMS or an e-mail.

For practical purposes the mobile communication device used for the inventive method can be a mobile phone, a PDA or an MDA. Other devices like laptops with mobile communication functionality can principally also
15 be used for the inventive method, though not allowing the same degree of mobility.

Accordingly, the invention proposes further a mobile communication device, in particular a mobile phone, a PDA or a MDA, comprising a camera, an application providing a database, means for synchronizing said
20 database with a database located on a server, means for analyzing an image recorded by means of said camera for ascertaining the information embedded within the recorded image, and means for comparing the ascertained information with information stored within said database.

For the purpose of communicating with a server the
25 device preferably comprises an infrared interface, or alternatively an interface adapted to establish a direct radio link, in particular according to Bluetooth, WLAN or HomeRF/SWAP standards.

With advantage the device further comprises an image
30 recognition system and/or a decoding system. For decoding 1- or 2-dimensional barcodes the device preferably is provided with an according barcode reader functionality.

To transmit information to a server via a GSM and/or UMTS communication network the device is preferably adapted
35 to operate on GPRS and/or HSCSD and/or EDGE standards.

The invention is described in more detail and in view of preferred embodiments hereinafter. Reference is made to the attached drawings.

Brief Description of the Figures

It is shown in

- Fig. 1 a schematic sketch of a system for performing the inventive method, in
- 5 Fig. 2 a schematic flow chart showing essential steps of performing a first embodiment of the inventive method, and in
- Fig. 3 a schematic flow chart showing essential steps of performing a second embodiment of the inventive
- 10 method.

Detailed Description of the Invention

Subsequently, preferred but exemplar embodiments of the
15 invention are described in more detail with regard to Fig. 1, Fig. 2 and Fig. 3.

In Fig. 1 a mobile phone 10 is depicted having a photo camera 12 mounted to the mobile phone 10. With reference sign
20 20, an article is marked having in the example a barcode 22 attached thereto, that includes coded information about the article 20.

If the user of the mobile phone 10 wants to interpret the coded information 22 of the article 20 and get access to
25 further information related to the article 20, first a database within the mobile phone 10 is synchronized with a corresponding database 32 located in a server 30, the database 32 holding a plurality of different code and/or article information.

30 The synchronization is performed by means of a direct radio link, as indicated by reference sign 60. For this purpose the mobile phone 10 is provided with an interface 14 adapted to operate according to Bluetooth standards. Accordingly the server comprises a corresponding interface
35 34. It is clear to one skilled in the art that the

synchronization can be optimized in that only changes in the server database made since the last synchronization need to be transferred, thereby considerably reducing the time needed for the synchronization process.

5 After synchronizing the databases a picture of the barcode 22 is recorded, as indicated by reference sign 50, by use of the camera 12 of the mobile phone 10. The record of the barcode 22 then is analyzed by means of a barcode reader functionality of the mobile phone 10. The analyzed
10 information is then compared with the information in the database and by that additional information related to the article 20 is found. This information can then be displayed in the display of the mobile phone.

 It is clear that the steps following activation by the
15 user are performed automatically by means of an application run on the mobile phone. The application can provide additional functionality like for instance a pre-selection of the information of the database entry related to the article 20 which is to be displayed.

20 The decoded information of a single or a plurality of articles can also be stored in a memory of the mobile phone 10 for later reference.

 In particular, whenever information of identical articles is decoded, this can also be counted. Thus
25 information about stock numbers can be gathered. For further processing this stock information can be transmitted via a GSM communication network 40 back to the server, in this example in the form of an e-mail attachment, as indicated by the reference signs 70.

30

Checking the prize in a selected currency

 Fig. 2 shows a schematic flow chart with essential steps of performing a preferred embodiment of the inventive method. The purpose in this example is to get the prize of an
35 article 20 with an attached barcode 22 in a selected

currency. This need arises for instance for a customer in a shop located in an international airport, the shop accepting a plurality of currencies.

For this purpose the customer uses his mobile phone 10
5 having a photo camera 12 and a Bluetooth interface 14.

The customer first moves into the range of an accordingly marked "hot spot" and establishes a connection between his mobile phone 10 and a server 30 according to Bluetooth standards. If the customer does not already have
10 the appropriate application stored on his mobile phone 10, it is transferred via Bluetooth from the server 30, along with the necessary database structure if needed. Then the database on the mobile phone is synchronized 81 with a corresponding database on the server, the server database holding prize
15 information in a plurality of currencies related to the information encoded in the barcode 22 for all articles in the shop.

After synchronization is finished the customer is notified by a message on the display and can now start the
20 application on the mobile phone 82. The application comprises a pre-selection functionality with regard to the currency that is to be displayed. So after starting the application the customer first selects a currency from a list 83.

After choosing an article 20 of interest the customer
25 records an image 84 of the attached barcode 22 by means of the camera 12 of his mobile phone 10.

The recorded image is then analyzed 85, and the analyzed information is compared with the available database entries 86. When the matching database entry is found, the
30 prize information in the pre-selected currency is displayed 87 on the display of the mobile phone.

If the customer wants to check another article 88, steps 84 to 87 are repeated, otherwise the application on the mobile phone is terminated 89.

Checking stock numbers

Fig. 2 shows a schematic flow chart with essential steps of performing another embodiment of the inventive method. The purpose in this example is to check the stock numbers of articles.

For this purpose a shop employee is equipped with a mobile phone 10 having a photo camera 12 and a Bluetooth interface 14.

10 According to the above described embodiment of the method, a database within the mobile phone 10 is synchronized 91 with a database 32 located on a server 30.

Then the employee starts 92 an appropriate application stored on the mobile phone 10 and records the image 93 of a barcode 22 attached to a first article 20. This record is
15 analyzed 94 and compared 95 with the database entries. In this example, from the database entry which is found to match the analyzed information an article ID is extracted and stored 96 in the memory of the mobile phone 10. The article
20 ID can for example be a consecutive number internally used by the shop.

The steps 93 to 96 are then repeated 97 for a plurality of articles, preferably for the complete stock of at least one article 20. To save memory of the mobile phone, whenever
25 an article ID is encountered that is already stored, it is not stored again, but instead a corresponding counter is raised by one.

After storing the article IDs of a plurality of articles in this way, this stored information is transmitted
30 98 as an e-mail attachment back to the server via a GSM communication network 40.

Although the invention is described with regard to specific embodiments, the invention is covering several
35 modified embodiments, without leaving the scope of protection

as defined by the appended set of claims.

For example, the internal or externally connectable camera of the mobile communication device may be additionally or alternatively designed as being a video camera, so that
5 the record is at least a part of a video sequence. Instead of the described mobile phone, an other mobile communication device may be used by the invention, for example a PDA or a MDA. Instead of using Bluetooth for synchronization WLAN or HomeRF/SWAP standards could be used, though according
10 interfaces in mobile devices are not yet widespread. Also an infrared connection can be used for synchronization.

Further, instead of providing the user visually by means of the display with the ascertained information related to the article, this could also be achieved acoustically for
15 example by means of an integrated loudspeaker.

Claims

1. Method of providing a user of a mobile communication device (10) having a camera (12) with information related to an article (20) having a coded information (22) attached thereto, comprising the steps of
synchronizing a database within the memory of the mobile communication device (10) with at least one database (32) located on at least one server (30),
recording an image (50) of the coded information (22) of the article by means of the camera (12),
analyzing the record for ascertaining the information embedded within the record, and
comparing the ascertained information with information stored within the synchronized database of the mobile communication device (10).
2. Method of claim 1, wherein the step of synchronizing is performed by using an infrared connection.
3. Method of claim 1, wherein the step of synchronizing is performed by using a direct radio link (60), in particular according to Bluetooth, WLAN or HomeRF/SWAP standards.
4. Method of claim 1, wherein prior to the step of synchronizing a software application is transmitted from the server (30) to the mobile communication device (10) and stored in the memory of the mobile communication device (10).
5. Method of claim 4, wherein the transmitted application provides the structure of the database to be synchronized.
6. Method of claim 1, wherein the step of recording (50) an image is performed by taking a picture or a video sequence.

7. Method of claim 1, wherein the step of analyzing is performed by using an image recognition system and/or a decoding system within the mobile communication device (10).
- 5
8. Method of claim 1, wherein the coded information is embedded within a barcode (22) and the step of analyzing is performed by using a barcode reader functionality of the mobile communication device (10).
- 10
9. Method of claim 1, wherein the user is provided visually and/or acoustically with the ascertained information related to said article.
- 15
10. Method of claim 1, wherein the information in the database contains information on at least one prize of at least one article (20).
- 20
11. Method of claim 1, wherein the information in the database contains information on at least two prizes of at least one article (20) in different currencies.
- 25
12. Method of claim 1, wherein the ascertained information of at least one record is stored within a memory of the mobile communication device (10).
- 30
13. Method of claim 1, wherein the ascertained information of a plurality of records is stored within a memory of the mobile communication device (10).
- 35
14. Method of claim 13, further comprising the step of transmitting the ascertained information of the plurality of records stored within the mobile communication device (10) to the server (30).

15. Method of claim 14, wherein the step of transmitting the ascertained information to the server (30) is performed via a GSM and/or UMTS communication network (40) which can be used by the mobile communication device (10), in particular a network supporting GPRS and/or HSCSD and/or EDGE standards.
16. Method of claim 1, wherein the method is performed by using a mobile phone, a PDA or a MDA as the mobile communication device (10).
17. Mobile communication device 10, in particular a mobile phone, a PDA or a MDA, comprising
a camera (12),
a database,
means for synchronizing said database with a database (32) located on a server (30),
means for analyzing an image recorded by means of said camera (12) for ascertaining the information embedded within the recorded image, and
means for comparing the ascertained information with information stored within said database.
18. Device of claim 17, further comprising an infrared interface.
19. Device of claim 17, further comprising an interface 14 adapted to establish a direct radio link (60), in particular according to Bluetooth, WLAN or HomeRF/SWAP standards.
20. Device of claim 17, further comprising an image recognition system and/or a decoding system.
21. Device of claim 17, having a barcode reader functionality.

22. Device of claim 17, adapted to operate on GPRS and/or HSCSD and/or EDGE standards.

5 23. Providing and/or using a device according to claim 17 for supporting a method according to claim 1.

Abstract

The invention relates to the provision of readable information related to an article having a coded information.

5 An object of the invention is to provide a new and improved way to get readable information based on coded information attached to an article.

10 The inventive solution proposes to provide a user of a mobile communication device having a camera with information related to an article having a coded information attached thereto, by synchronizing a database within the memory of the mobile communication device with at least one database located on at least one server, recording an image of the coded information of the article by means of the camera, analyzing the record for ascertaining the information embedded within the record,
15 and comparing the ascertained information with information stored within the synchronized database of the mobile communication device.

Fig. 1

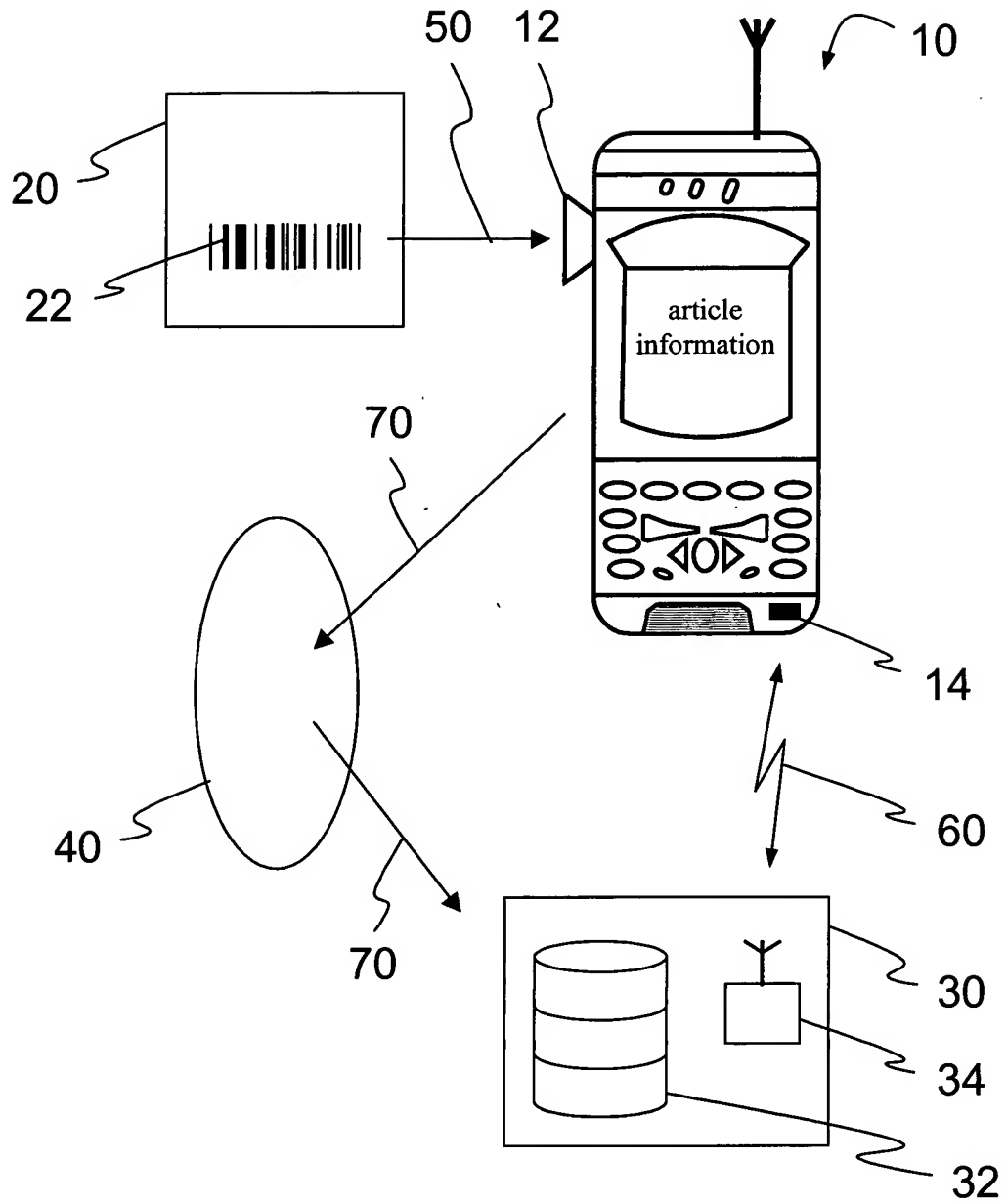


Fig. 2

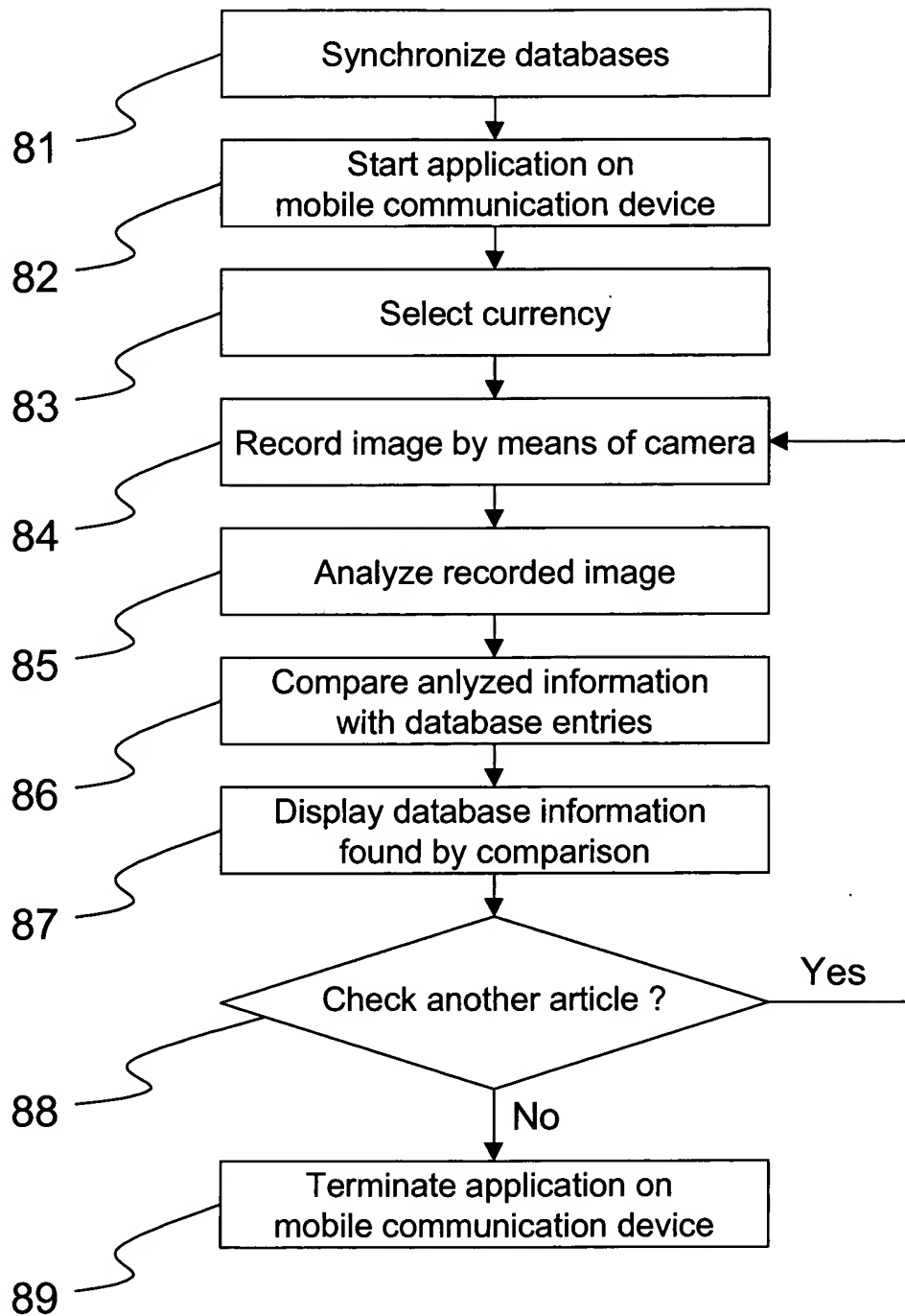


Fig. 3

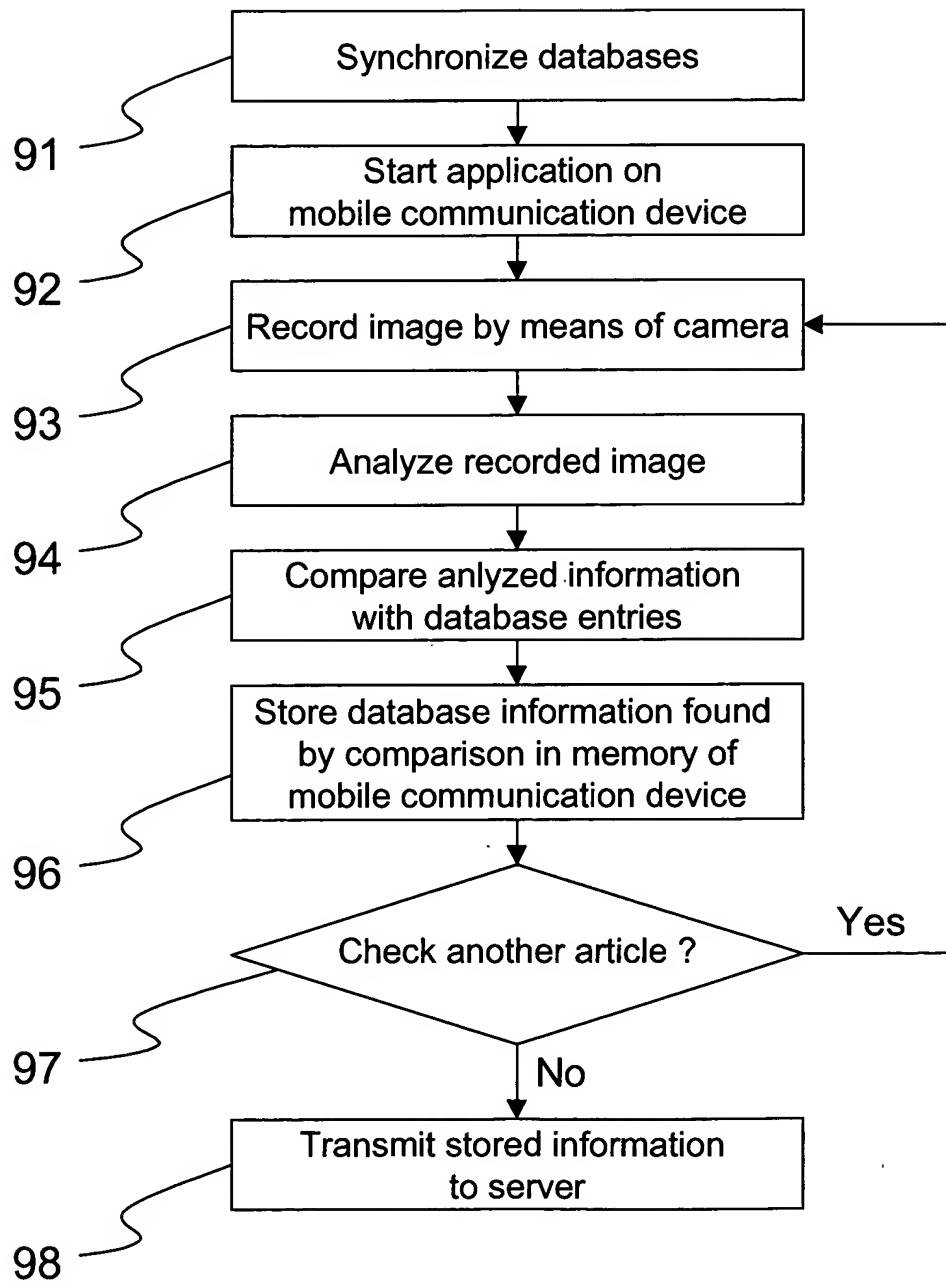


EXHIBIT C

Patentanwälte
Blumbach, Kramer & Partner GbR
Alexandrastraße 5

65187 Wiesbaden

Applicant: Agere Systems Inc.
Our Ref.: 03OP 0107DEP
Your Ref.: IDS 124639
"Use of the mobile phone as barcode reader"

The undersigned states his approval of the text and the drawings
as attached.

Munich

Place,

30.6.2003

date,

Wolfgang Scheit

Wolfgang Scheit

RECEIVED

JUL 7 2003

AGERE SYSTEMS INC.